

SUGARBUSH RESIDENTIAL DEVELOPMENT PROJECT

APPENDIX H

AIR QUALITY TECHNICAL REPORT

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for the

DRAFT ENVIRONMENTAL IMPACT REPORT

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Air Quality Technical Report

for the

Sugarbush Residential Development Project

GPA 05-010/TM #5295RPL7

RO 4-008/SP 03-003/S04-015

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Glossary of Terms and Acronyms

APCD	Air Pollution Control District
AQIA	Air Quality Impact Assessment
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
BACM	Best Available Control Measure
BACT	Best Available Control Technology
BMPs	Best Management Practices
CAA	Clean Air Act (Federal)
CAAQS	California Ambient Air Quality Standard
CALINE4	California Line Source Dispersion Model (Version 4)
Caltrans	California Department of Transportation
CCAA	California Clean Air Act
CO	Carbon Monoxide
DPLU	San Diego County Department of Planning and Land Use
EPA	United States Environmental Protection Agency
H ₂ S	Hydrogen Sulfide
HARP	HotSpots Analysis and Reporting Program
HI	Hazard Index
ISCST	Industrial Source Complex Short Term Model
mg/m ³	Milligrams per Cubic Meter
µg/m ³	Micrograms per Cubic Meter
NAAQS	National Ambient Air Quality Standard
NO _x	Oxides of Nitrogen
NO ₂	Nitrogen Dioxide
O ₃	Ozone
PM _{2.5}	Fine Particulate Matter (particulate matter with an aerodynamic diameter of 2.5 microns or less)
PM ₁₀	Respirable Particulate Matter (particulate matter with an aerodynamic diameter of 10 microns or less)
ppm	Parts per million
PSD	Prevention of Significant Deterioration
RAQS	San Diego County Regional Air Quality Strategy
ROCs	Reactive Organic Compounds
ROG	Reactive Organic Gases
SANDAG	San Diego Association of Governments
SCAQMD	South Coast Air Quality Management District
SCAB	South Coast Air Basin
SDAB	San Diego Air Basin
SDAPCD	San Diego County Air Pollution Control District
SIP	State Implementation Plan
SO _x	Oxides of Sulfur
SO ₂	Sulfur Dioxide

TACs	Toxic Air Contaminants
T-BACT	Toxics Best Available Control Technology
VOCs	Volatile Organic Compounds

Executive Summary

This report presents an assessment of potential air quality impacts associated with the proposed Sugarbush Residential Project. The evaluation addresses the potential for air emissions during construction and after full buildout of the project, including an assessment of the potential for carbon monoxide (CO) “hot spots” to form due to traffic associated with the proposed project.

The proposed project would result in emissions of air pollutants for both the construction phase and operational phase of the project. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment and construction workers commuting to and from the site. Emissions of criteria pollutants would be below the significance thresholds and would not result in a significant air quality impact.

The main operational impacts associated with the Project would include impacts associated with traffic; impacts associated with area sources such as energy use, landscaping, and the use of fireplaces at the residences. Emissions of criteria pollutants are below the significance thresholds for project operations for all pollutants. Also, because the project would not exceed the growth projections in the San Diego Association of Governments (SANDAG) growth forecasts for the San Marcos Subregional Area as discussed in Section 4.1.2, the project would not result in an exceedance of the ozone standard and impacts associated with project operations would therefore be less than significant.

A health risk assessment was conducted to evaluate the potential for project construction or operations to result in a significant impact to nearby sensitive receptors. The risk assessment focused on diesel particulate matter, which is the main toxic air contaminant (TAC) emitted from vehicles. The risk assessment concluded that risks were less than significant.

An evaluation of odors indicated that odor impacts would be less than significant.

1.0 INTRODUCTION

1.1 Purpose of the Report

This report presents an assessment of potential air quality impacts associated with the proposed Sugarbush Residential Project. The evaluation addresses the potential for air emissions during construction and after full buildout of the project, including an assessment of the potential for carbon monoxide (CO) “hot spots” to form due to traffic associated with the proposed project.

1.2 Project Location and Description

The Sugarbush residential development project is located within the unincorporated County of San Diego near the City of San Marcos. The project site is located south of Buena Creek Road. Access to the development will be via Sugarbush Drive from Buena Creek Road. Figure 1 provides a location map of the development.

The project will be developed on approximately 115.5 acres with 45 residential lots and 2 open space lots. The minimum lot size proposed for the residential lots is 0.5 acre. In addition, the project includes utilities to service the community.

The project would be constructed using best management practices to reduce the amount of fugitive dust generated from construction of the proposed project, and their respective control efficiencies. These dust control measures that will be included in the project include the following:

- Multiple applications of water during grading between dozer/scrapper passes
- Paving, chip sealing or chemical stabilization of internal roadways after completion of grading
- Use of sweepers or water trucks to remove “track-out” at any point of public street access
- Termination of grading if winds exceed 25 mph
- Stabilization of dirt storage piles by chemical binders, tarps, fencing or other erosion control
- Hydroseeding of graded residential lots

This Air Quality Technical Report includes an evaluation of existing conditions in the project vicinity, an assessment of potential impacts associated with project construction, and an evaluation of project operational impacts.

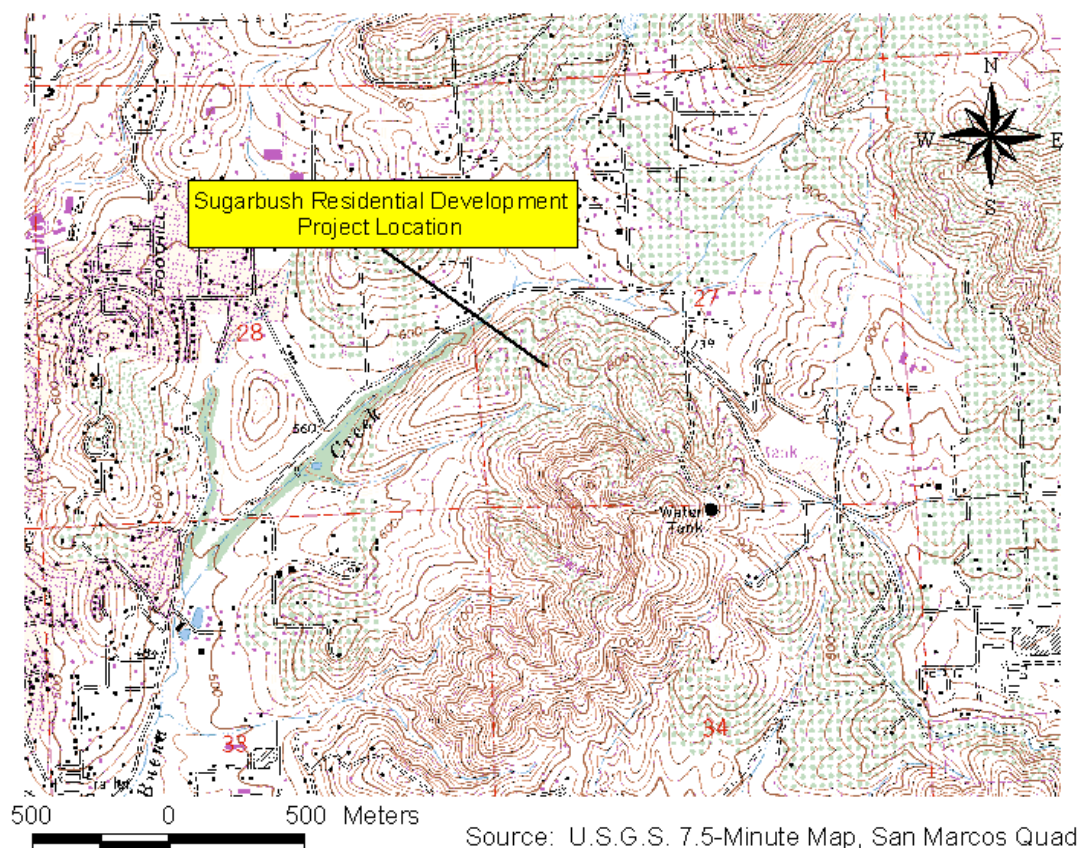


Figure 1. Sugarbush Residential Development Project Location

2.0 EXISTING CONDITIONS

2.1 Existing Setting

The project site is located in northern San Diego County in the unincorporated area of the County, near the City of San Marcos. The site is currently undeveloped. Surrounding lands to the north and west are developed with single-family residential dwellings.

2.2 Climate and Meteorology

The project site is located in the San Diego Air Basin (SDAB). The climate of the SDAB is dominated by a semi-permanent high pressure cell located over the Pacific Ocean. This cell influences the direction of prevailing winds (westerly to northwesterly) and maintains clear skies for much of the year. Figure 2 provides a graphic representation of the prevailing winds in the project vicinity, as measured at the San Diego Air Pollution Control District's (APCD's) Escondido Monitoring Station (the closest meteorological monitoring station to the site). The high pressure cell also creates two types of temperature inversions that may act to degrade local air quality.

Subsidence inversions occur during the warmer months as descending air associated with the Pacific high pressure cell comes into contact with cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce ozone (O₃), commonly known as smog.

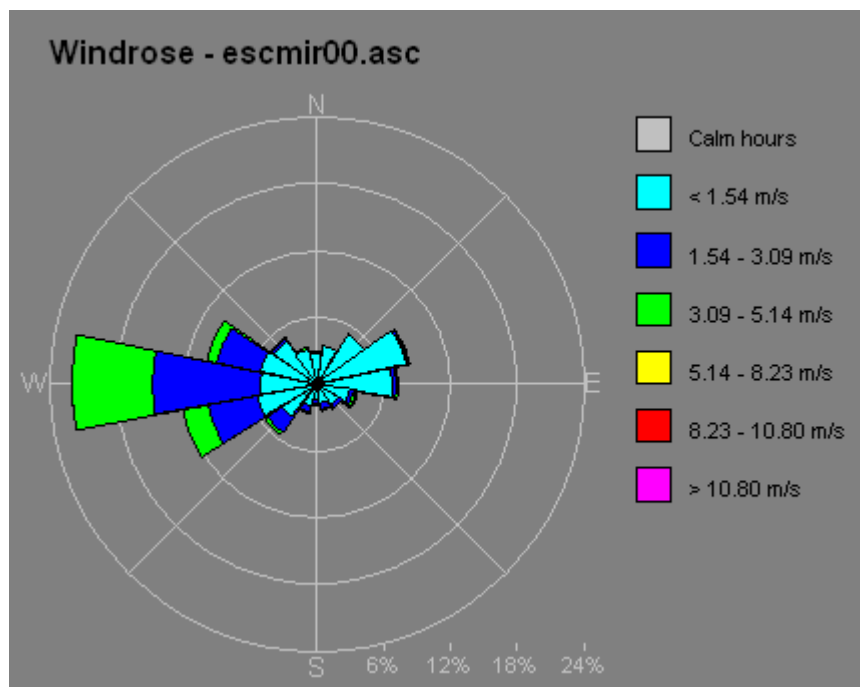


Figure 2. Wind Rose – Escondido Monitoring Station

2.3 Regulatory Setting

Air quality is defined by ambient air concentrations of specific pollutants identified by the United States Environmental Protection Agency (EPA) to be of concern with respect to health and welfare of the general public. The EPA is responsible for enforcing the Federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. The CAA required the EPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the EPA established both primary and secondary standards for several pollutants (called “criteria” pollutants). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants in the atmosphere.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The California Air Resources Board (ARB) has established the more stringent California Ambient Air Quality Standards (CAAQS) for the

six criteria pollutants through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be “nonattainment areas” for that pollutant. In December 2002, the APCD submitted a maintenance plan for the 1-hour NAAQS for O₃ and requested redesignation from a serious O₃ nonattainment area to attainment. As of July 28, 2003, the San Diego Air Basin has been reclassified as an attainment area for the 1-hour NAAQS for O₃. On April 15, 2004, the SDAB was designated a basic nonattainment area for the 8-hour NAAQS for O₃. The SDAB is in attainment for the NAAQS for all other criteria pollutants. The SDAB is currently classified as a nonattainment area under the CAAQS for O₃ and PM₁₀.

The ARB is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. The ARB is responsible for the development, adoption, and enforcement of the state’s motor vehicle emissions program, as well as the adoption of the CAAQS. The ARB also reviews operations and programs of the local air districts, and requires each air district with jurisdiction over a nonattainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The APCD is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County.

The APCD and the San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, 2004, and 2009. The RAQS outlines APCD’s plans and control measures designed to attain the state air quality standards for O₃. The APCD has also developed the air basin’s input to the SIP, which is required under the Federal Clean Air Act for areas that are out of attainment of air quality standards. The SIP includes the APCD’s plans and control

measures for attaining the O₃ NAAQS. The SIP is also updated on a triennial basis. The latest SIP update for O₃ attainment was submitted by the ARB to the EPA in 2007.

The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The SIP also includes rules and regulations that have been adopted by the APCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project's emissions would have the potential to conflict with the SIP and thereby hinder attainment of the NAAQS for O₃.

Table 1 presents a summary of the ambient air quality standards adopted by the federal and California Clean Air Acts.

Table 1
Ambient Air Quality Standards

POLLUTANT	AVERAGE TIME	CALIFORNIA STANDARDS		NATIONAL STANDARDS		
		Concentration	Measurement Method	Primary	Secondary	Measurement Method
Ozone (O ₃)	1 hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	--	--	Ethylene Chemiluminescence
	8 hour	0.070 ppm (137 µg/m ³)		0.075 ppm (147 µg/m ³)	0.075 ppm (147 µg/m ³)	
Carbon Monoxide (CO)	8 hours	9.0 ppm (10 mg/m ³)	Non-Dispersive Infrared Spectroscopy (NDIR)	9 ppm (10 mg/m ³)	None	Non-Dispersive Infrared Spectroscopy (NDIR)
	1 hour	20 ppm (23 mg/m ³)		35 ppm (40 mg/m ³)		
Nitrogen Dioxide (NO ₂)	Annual Average	0.030 ppm (56 µg/m ³)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m ³)	0.053 ppm (100 µg/m ³)	Gas Phase Chemiluminescence
	1 hour	0.18 ppm (338 µg/m ³)		--	--	
Sulfur Dioxide (SO ₂)	Annual Average	--	Ultraviolet Fluorescence	0.03 ppm (80 µg/m ³)	--	Pararosaniline
	24 hours	0.04 ppm (105 µg/m ³)		0.14 ppm (365 µg/m ³)	--	
	3 hours	--		--	0.5 ppm (1300 µg/m ³)	
	1 hour	0.25 ppm (655 µg/m ³)		--	--	
Respirable Particulate Matter (PM ₁₀)	24 hours	50 µg/m ³	Gravimetric or Beta Attenuation	150 µg/m ³	150 µg/m ³	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m ³		--	--	
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	Gravimetric or Beta Attenuation	15 µg/m ³	15 µg/m ³	Inertial Separation and Gravimetric Analysis
	24 hours	--		35 µg/m ³	35 µg/m ³	
Sulfates	24 hours	25 µg/m ³	Ion Chromatography	--	--	--
Lead (Pb)	30-day Average	1.5 µg/m ³	Atomic Absorption	--	--	Atomic Absorption
	Calendar Quarter	--		1.5 µg/m ³	1.5 µg/m ³	
	3-month Rolling Average	--		0.15 µg/m ³	0.15 µg/m ³	
Hydrogen Sulfide (H ₂ S)	1 hour	0.03 ppm (42 µg/m ³)	Ultraviolet Fluorescence	--	--	--
Vinyl Chloride	24 hours	0.010 ppm (26 µg/m ³)	Gas Chromatography	--	--	--

ppm= parts per million; µg/m³ = micrograms per cubic meter; mg/m³= milligrams per cubic meter
Source: California Air Resources Board 2009

2.4 Background Air Quality

The APCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring stations to the project site are the Escondido East Valley Parkway station, and the San Diego downtown station (which is the closest station that measures sulfur dioxide (SO₂)). Because both the Escondido and San Diego downtown monitoring stations are located in areas where there is substantial traffic congestion, it is likely that pollutant concentrations measured at those monitoring stations are higher than concentrations that would be observed or measured in the Project area, and would thus provide a conservative estimate of background ambient air quality. Ambient concentrations of pollutants over the last three years are presented in Table 2.

The federal 8-hour ozone standard, which was formally adopted in 2001 after legal arguments with the EPA, and was lowered to 0.075 parts per million (ppm) in 2008, was exceeded at the Escondido monitoring station six times in 2006, three times in 2007, and 13 times in 2008. The Escondido monitoring station measured exceedances of the state PM₁₀ and PM_{2.5} standards during the period from 2006 to 2008; however, the highest values were recorded during the southern California fire event in 2007. The data from the monitoring stations indicate that air quality is in attainment of all other federal standards.

Concentrations of CO at the Escondido monitoring station tend to be among the highest in the San Diego Air Basin, due to the fact that the monitor is located along East Valley Parkway in a congested area in downtown Escondido. The station sees higher concentrations of CO than have historically been measured elsewhere in San Diego County and the background data are not likely to be representative of background ambient CO concentrations at the Project site, due to the site's location in a less developed area. Since 2000, CO has not been monitored at other stations in northern San Diego County.

Table 2
Ambient Background Concentrations
 (ppm unless otherwise indicated)

Pollutant	Averaging Time	2006	2007	2008	Most Stringent Ambient Air Quality Standard	Monitoring Station
Ozone	8 hour	0.096	0.077	0.098	0.08	Escondido
	1 hour	0.108	0.094	0.116	0.09	Escondido
PM ₁₀	Annual	24.1 µg/m ³	26.7 µg/m ³	24.7 µg/m ³	20 µg/m ³	Escondido
	24 hour	52 µg/m ³	68 µg/m ³	84 µg/m ³	50 µg/m ³	Escondido
PM _{2.5}	Annual	11.5 µg/m ³	13.3 µg/m ³	12.4 µg/m ³	12 µg/m ³	Escondido
	24 hour	40.6 µg/m ³	126.2 µg/m ³	44.0 µg/m ³	35 µg/m ³	Escondido
NO ₂	Annual	0.017	0.016	0.018	0.030	Escondido
	1 hour	0.071	0.072	0.081	0.17	Escondido
CO	8 hour	3.61	3.19	2.81	9.0	Escondido
	1 hour	5.7	5.2	4.6	20	Escondido
SO ₂	Annual	0.004	0.003	0.002	0.03	San Diego
	24 hour	0.009	0.006	0.007	0.04	San Diego
	3 hour	0.030	0.010	0.014	0.5 ¹	San Diego
	1 hour	0.034	0.018	0.019	0.25	San Diego

¹Secondary NAAQS

Source: www.arb.ca.gov/aqd/aqd.htm (Measurements of all pollutants at Escondido-E Valley Parkway station, except SO₂)
www.epa.gov/air/data/monvals.html (1-hour and 3-hour SO₂ and 1-hour CO)

3.0 SIGNIFICANCE CRITERIA AND ANALYSIS METHODOLOGIES

The County of San Diego (County of San Diego 2007) has approved guidelines for determining significance based on Appendix G.III of the State CEQA Guidelines, which provides guidance that a project would have a significant environmental impact if it would:

1. Conflict or obstruct the implementation of the San Diego Regional Air Quality Strategy (RAQS) or applicable portions of the State Implementation Plan (SIP);
2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;

3. Result in a cumulatively considerable net increase of PM₁₀ or exceed quantitative thresholds for O₃ precursors, oxides of nitrogen (NO_x) and volatile organic compounds (VOCs);
4. Expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations; or
5. Create objectionable odors affecting a substantial number of people.

The County of San Diego recognizes the San Diego Air Pollution Control District's established screening level thresholds for air quality emissions (Rules 20.1 et seq.) as screening-level thresholds for land development projects. As stated above, projects that propose development that is consistent with the growth anticipated by the general plans and SANDAG's growth forecasts would be consistent with the RAQS and SIP. Also, projects that are consistent with the SIP rules (i.e., the federally-approved rules and regulations adopted by the APCD) are consistent with the SIP. Thus projects would be required to conform with measures adopted in the RAQS (including use of low-VOC architectural coatings, use of low-NO_x water heaters, and compliance with rules and regulations governing stationary sources) and would also be required to comply with all applicable rules and regulations adopted by the APCD.

To determine whether a project would (a) result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation; or (b) result in a cumulatively considerable net increase of PM₁₀ or exceed quantitative thresholds for O₃ precursors, oxides of nitrogen (NO_x) and volatile organic compounds (VOCs), project emissions may be evaluated based on the quantitative emission thresholds established by the San Diego APCD. As part of its air quality permitting process, the APCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIA). The County of San Diego has also adopted the South Coast Air Quality Management District (SCAQMD)'s screening threshold of 55 pounds per day or 10 tons per year as a significance threshold for PM_{2.5}.

For California Environmental Quality Act (CEQA) purposes, these screening criteria can be used as numeric methods to demonstrate that a project's total emissions would not result in a significant impact to air quality. The screening thresholds are included in the table below.

Table 3
Screening-Level Thresholds for Air Quality Impact Analysis

Pollutant	Total Emissions		
Construction Emissions			
	Lb. per Day		
Respirable Particulate Matter (PM ₁₀)	100		
Fine Particulate Matter (PM _{2.5})	55		
Oxides of Nitrogen (NOx)	250		
Oxides of Sulfur (SOx)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOCs) ¹	75		
Operational Emissions			
	Lb. Per Hour	Lb. per Day	Tons per Year
Respirable Particulate Matter (PM ₁₀)	---	100	15
Fine Particulate Matter (PM _{2.5})	---	55	10
Oxides of Nitrogen (NOx)	25	250	40
Oxides of Sulfur (SOx)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	---	3.2	0.6
Volatile Organic Compounds (VOC)	---	75	13.7
Toxic Air Contaminant Emissions			
Excess Cancer Risk	1 in 1 million		
Non-Cancer Hazard	1.0		

In the event that emissions exceed these screening-level thresholds, modeling would be required to demonstrate that the project's total air quality impacts result in ground-level concentrations that are below the State and Federal Ambient Air Quality Standards, including appropriate background levels. For nonattainment pollutants (ozone, with ozone precursors NO_x and VOCs, PM_{2.5} and PM₁₀), if emissions exceed the thresholds shown in Table 3, the project could have the

potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as toxic air contaminants (TACs) or Hazardous Air Pollutants (HAPs). In San Diego County, the County Department of Planning and Land Use identifies an excess cancer risk level of 1 in 1 million or less for projects that do not implement Toxics Best Available Control Technology (T-BACT), and an excess cancer risk level of 10 in 1 million or less for projects that do implement T-BACT. The significance threshold for non-cancer health effects is a health hazard index of one or less. These significance thresholds are consistent with the San Diego Air Pollution Control District's Rule 1210 requirements for stationary sources. If a project has the potential to result in emissions of any TAC or HAP which result in a cancer risk of greater than 1 in 1 million without T-BACT, 10 in 1 million with T-BACT, or health hazard index of one or more, the project would be deemed to have a potentially significant impact.

With regard to evaluating whether a project would have a significant impact on sensitive receptors, air quality regulators typically define sensitive receptors as schools (Preschool-12th Grade), hospitals, resident care facilities, or day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. Any project which has the potential to directly impact a sensitive receptor located within 1 mile and results in a health risk greater than the risk significance thresholds discussed above would be deemed to have a potentially significant impact.

Section 6318 of the San Diego County Zoning Ordinance requires all commercial and industrial uses "be operated as not to emit matter causing unpleasant odors which is perceptible by the average person at or beyond any lot line of the lot containing said uses." APCD Rule 51 (Public Nuisance) also prohibits emission of any material which causes nuisance to a considerable number of persons or endangers the comfort, health or safety of any person. A project that proposes a use which would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of offsite receptors.

The impacts associated with construction and operation of the project were evaluated for significance based on these significance criteria.

4.0 PROJECT IMPACT ANALYSIS

The proposed Sugarbush Residential Project includes both construction and operational impacts. Construction impacts include emissions associated with the construction of the project. Operational impacts include emissions associated with the project, including traffic, at full buildout.

4.1 Conformance to the Regional Air Quality Strategy

4.1.1 Guidelines for the Determination of Significance

The RAQS outlines APCD's plans and control measures designed to attain the State air quality standards for ozone. In addition, the APCD relies on the SIP, which includes the APCD's plans and control measures for attaining the ozone NAAQS. These plans accommodate emissions from all sources, including natural sources, through implementation of control measures, where feasible, on stationary sources to attain the standards. Mobile sources are regulated by the EPA and the ARB, and the emissions and reduction strategies related to mobile sources are considered in the RAQS and SIP.

The RAQS relies on information from ARB and SANDAG, including projected growth in the County, mobile, area and all other source emissions in order to project future emissions and determine from that the strategies necessary for the reduction of stationary source emissions through regulatory controls. The ARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and by the County. As such, projects that propose development that is consistent with the growth anticipated by the general plans would be consistent with the RAQS. In the event that a project would propose development which is less dense than anticipated within the general plan, the project would likewise be consistent with the RAQS. If a project proposes

development that is greater than that anticipated in the County of San Diego General Plan and SANDAG's growth projections, the project would be in conflict with the RAQS and SIP, and might have a potentially significant impact on air quality. This situation would warrant further analysis to determine if the proposed project and the surrounding projects exceed the growth projections used in the RAQS for the specific subregional area.

4.1.2 Significance of Impacts Prior to Mitigation

The Sugarbush Residential Project is proposing to add 45 single-family residential units in the unincorporated area of the County. The Project is located in the North County East Major Statistical Area, in the San Marcos Subregional Area. The total cumulative housing projected for the San Marcos Subregional Area for 2030, according to SANDAG projections, is an additional 28,401 dwelling units. The project's projected growth of 45 dwelling units is consistent with the number of units allowed on the site in the General Plan, and is only 0.15 percent of the total growth projected for the Subregional Area. Thus the growth projected for the Sugarbush Residential Project would not result in a cumulatively significant impact and the project would be consistent with the RAQS and SIP.

4.1.3 Mitigation Measures and Design Considerations

Because the Project's growth would not exceed the growth projections included by SANDAG in the RAQS and SIP, no mitigation measures are required.

4.1.4 Conclusions

The Sugarbush Residential Project would conform with the RAQS and SIP and would not result in a significant impact.

4.2 Conformance to Federal and State Ambient Air Quality Standards

4.2.1 Construction Impacts

4.2.1.1 Guidelines for the Determination of Significance

Based on the County of San Diego Guidelines (County of San Diego 2007), construction impacts would be potentially significant if they exceed the quantitative screening-level thresholds for attainment pollutants (NO₂, SO₂, and CO), and would result in a significant impact if they exceed the screening-level thresholds for nonattainment pollutants (ozone precursors and particulate matter).

4.2.1.2 Significance of Impacts Prior to Mitigation

Emissions of pollutants such as fugitive dust that are generated during construction are generally highest near the construction site. Emissions from the construction phase of the project were estimated through the use of emission factors from the South Coast Air Quality Management District's CEQA Air Quality Handbook (SCAQMD 1993) and the ARB OFFROAD Model emission factors for construction equipment. It was assumed that heavy construction equipment would be operating at the site for eight hours per day, six days per week during project construction.

It was estimated that the grading and construction phase of the project would last approximately 18 months. The grading portion of the project would involve 322,000 cubic yards of cut and the same amount of fill (including that required for the secondary access road), which requires no import or disposal of materials. It was assumed that approximately 5 acres or less would be graded on any single day. The types of utilities and infrastructure improvements required for the development include the following:

1. Wet utilities construction (sewer, water, storm drains)
2. Dry utilities construction

3. Curb and gutter construction
4. Asphalt and paving
5. House construction

Fugitive dust emissions were estimated using the emission factor for PM₁₀ emissions from construction recommended in the SCAQMD CEQA Air Quality Handbook, Table A9-9, of 26.4 lbs/acre/day. Assuming a maximum of 5 acres would be graded in a single day, the daily PM₁₀ emissions would be as much as 132 lbs/day.

Construction heavy equipment requirements were estimated based on similar projects and an estimate of the requirements the construction of the Project. Table 4 presents the assumed maximum heavy construction equipment requirements for Project construction. The number of equipment presented in the table below represents a worst-case estimate of the number and type of equipment required at any one time. Grading/site preparation and site utilities/infrastructure construction will occur simultaneously toward the end of the site preparation phase; this overlap of construction phases is anticipated to last no more than one month. The equipment requirements for the overlap of site preparation and site utilities/infrastructure are shown as a separate phase in Table 4. House construction will not occur simultaneously with other construction and will be implemented in phases during project construction.

Table 4
Construction Equipment

Construction Phase	Equipment	Number
Grading and Site Preparation	Scrapers	2
	Dozers	2
	Water truck	1
	Motor grader	1
	Loaders	1
	Compactor	1
Site Preparation/Site Utilities Overlap	Motor Grader	1
	Loaders	1
	Rubber Tire Compactor	1
	Trencher	1
	Scraper	1
	Water Trucks	1
Site Utilities/ Infrastructure Construction	Paddle scraper	1
	Blade	1
	Water truck	1
	Roller compactor	2
	Paver	1
	Rubber tire compactor	2
	Concrete/Rock trucks	1
	Asphalt truck	1
House Construction	Pettibone crane	1
	Concrete trucks	3
	Material trucks	4

The maximum number of construction workers for each phase was estimated based on the methodology presented in the SCAQMD CEQA Air Quality Handbook, Table A9-17 and associated tables. Refer to Attachment A for detailed calculations. The worst-case emissions were based on the maximum number of workers calculated for any phase of the construction of the Project. It was also assumed that a maximum of 25 daily construction truck trips would occur during the grading and site preparation phase, and 15 daily construction truck trips during the overlap of site preparation and site utilities, and for the site utilities/infrastructure construction phase.

According to the URBEMIS Model, emissions from asphalt offgassing can be estimated by assuming an emission rate of 2.62 lbs/acre of area to be paved. Based on the length of the road that will be paved within the Sugarbush Residential Development (approximately 6900 feet total), assuming the road width will be approximately 30 feet (15 feet per lane for two lane road), a total of 4.75 acres would requiring paving, for a total of 12.5 lbs of ROC emissions. In addition, a portion of the Cleveland Trail will be paved; the portion would be approximately 850

feet long by 24 feet wide for a total of 0.47 acres, for a total of 1.23 lbs of ROC emissions. Assuming asphalt paving occurs over a one-week (6-day) period, ROC emissions are approximately 2.29 lbs/day. For the purpose of estimating emissions from the house construction phase, it was assumed that a maximum of 18 houses would be constructed on any one day. Furthermore, it was assumed that water-based coatings would be used for both exterior and interior surfaces.

Best management practices to reduce the amount of fugitive dust generated from construction of the proposed project, and their respective control efficiencies (based on control efficiencies provided in the SCAQMD CEQA Air Quality Handbook, Table 11-4), include the following:

- Multiple applications of water during grading between dozer/scrapper passes – 34-68%
- Paving, chip sealing or chemical stabilization of internal roadways after completion of grading – 92.5%
- Use of sweepers or water trucks to remove “track-out” at any point of public street access – 25-60%
- Termination of grading if winds exceed 25 mph – not quantified
- Stabilization of dirt storage piles by chemical binders, tarps, fencing or other erosion control – 30-65%
- Hydroseeding of graded residential lots – 30-65%

Although it was assumed that all of the above dust control measures would be implemented, to model the most conservative construction estimates, only application of water during grading was taken into consideration when applying a control efficiency on particulate emissions. For conservative purposes, it was assumed that an average control efficiency of 51% (the average of 34% and 68%, which are the high and low range of control efficiencies cited in the SCAQMD CEQA Air Quality Handbook, Table 11-4), would be realized through application of water at least twice daily. For conservative purposes, the other control measures were not accounted for in the emission calculations. Emission estimates for construction with implementation of the above-listed dust control measures are shown in Table 5. Detailed emission calculations are shown in Attachment A.

Table 5
Estimated Construction Emissions – With Dust Control Measures

Emission Source	Control Efficiency	ROC	NO_x	CO	SO_x	PM₁₀	PM_{2.5}
lbs/day							
<i>Grading and Site Preparation</i>							
Fugitive Dust	51%	-	-	-	-	64.68	13.58
Heavy Equipment Exhaust		13.91	124.94	58.93	0.11	5.38	4.79
Construction Truck Trips		0.95	16.61	4.92	0.02	0.66	0.57
Worker Travel – Vehicle Emissions		0.29	0.56	6.02	0.01	0.07	0.04
TOTAL		15.15	142.11	69.87	0.14	70.79	18.98
Significance Criteria		75	250	550	250	100	55
<i>Significant?</i>		<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
<i>Site Utilities/House Construction</i>							
Asphalt Offgassing		2.29		-	-	-	-
Heavy Equipment Exhaust		19.34	170.03	66.53	0.18	7.84	6.97
Construction Truck Trips		0.63	10.96	3.25	0.01	0.44	0.37
Worker Travel – Vehicle Emissions		3.25	6.28	67.72	0.10	0.80	0.44
TOTAL		25.51	187.27	137.50	0.29	9.08	7.78
Significance Criteria		75	250	550	250	100	55
<i>Significant?</i>		<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Even without taking into consideration the other control measures as discussed above, but only considering watering between grading passes with a control efficiency of 51%, the estimated PM₁₀ emissions during the grading phase of the project construction would be below the San Diego County significance criteria.

Project construction would employ those dust control measures specified above and would therefore be in compliance with strategies in the RAQS and SIP for attaining and maintaining the air quality standards. The Project construction would therefore not conflict or obstruct the implementation of the RAQS or applicable portions of the SIP. Furthermore, due to the fact that the construction phase of the project is short-term in nature, Project construction would not result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation, nor result in a cumulatively considerable net increase of PM₁₀ or exceed quantitative thresholds for O₃ precursors, NO_x and ROCs.

4.2.1.3 Mitigation Measures and Design Considerations

Project construction would employ those dust control measures specified above. Emissions are below the significance thresholds; therefore, no mitigation measures are required.

4.2.1.4 Conclusions

Project criteria pollutants emissions during construction would constitute be less than significant.

4.2.2 Operational Impacts

4.2.2.1 Guidelines for the Determination of Significance

Based on the County of San Diego Guidelines (County of San Diego 2007), operational impacts would be potentially significant if they exceed the quantitative screening-level thresholds for attainment pollutants (NO₂, SO₂, and CO), and would result in a significant impact if they exceed the screening-level thresholds for nonattainment pollutants (ozone precursors and particulate matter).

4.2.2.2 Significance of Impacts Prior to Mitigation

The main operational impacts associated with the Project would be confined to impacts associated with traffic. Minor impacts would be associated with energy use and the use of fireplaces at the residences.

To address whether the Project would result in emissions that would violate any air quality standard or contribute substantially to an existing or proposed air quality violation, the emissions associated with Project-generated traffic were compared with the County of San Diego's significance criteria. According to the Traffic Impact Analysis, Sugarbush Subdivision (Linscott Law & Greenspan 2009), the Project-generated daily traffic is estimated to be 12 trips per

dwelling unit; for 45 residences, the trips associated with the project will amount to 540 average daily trips.

To estimate emissions associated with Project-generated traffic, the EMFAC2007 model (ARB 2007) was used. The EMFAC2007 model is the latest version of the Caltrans emission factor model for on-road traffic. Because the Project is a residential development, Project-related traffic was assumed to be comprised of light duty autos and light duty trucks (i.e., small trucks, SUVs, and vans). Based recommendations in the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1998), Appendix B, Page B-3, it was assumed that the vehicle mix, when distributed between light duty autos and light duty trucks, would be 78% light duty autos and 22% light duty trucks. [This assumption was based on Table B.2, Recommended Vehicle Type Distribution, of the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol, assuming that light duty autos (69% of total vehicle distribution) and light duty trucks (19.4% of total vehicle distribution) comprised 100% of the total vehicle distribution; therefore, light duty autos comprise $69\% / (69\% + 19.4\%)$ or 78%, and light duty trucks comprise $19.4\% / (69\% + 19.4\%)$ or 22% of total vehicles accessing the residential development.] For estimating emission factors associated with light duty autos and light duty trucks, it was assumed that these vehicles would be a mix of non-catalytic, catalytic, and diesel vehicles as indicated in the EMFAC2007 outputs. For conservative purposes, emission factors representing the vehicle mix for 2010 were used to estimate emissions; based on the results of the EMFAC2007 model for subsequent years, emissions would decrease on an annual basis from 2010 onward due to phase-out of higher polluting vehicles and implementation of more stringent emission standards that are taken into account in the EMFAC2007 model. Vehicle speed was assumed to be 27 miles per hour, based on a speed limit of 30 miles per hour in the residential development, and utilizing the recommended average cruise speed in Appendix B of the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol, Table B.10, Average Cruise Speed as a Function of Arterial Classification and Free-Flow Speed, for a minor arterial, suburban. The average vehicle miles traveled within the Buena Creek development was assumed to be 0.4 miles, based on the project site map. Table 6 presents the results of the emission calculations, in lbs/day and tons/year, along with a comparison with the County of San Diego significance criteria.

Table 6
Traffic Emissions

	ROC	NOx	CO	SOx	PM10	PM2.5
	Lbs/day					
Vehicular Emissions	4.02	2.60	33.38	0.03	0.26	0.15
Significance Criteria	55	250	550	250	100	55
<i>Significant?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
	Tons/year					
Vehicular Emissions	0.73	0.47	6.09	0.01	0.05	0.03
Significance Criteria	10	40	100	100	15	10
<i>Significant?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Operational impacts associated with energy use were estimated based on the SCAQMD's emission factors for residential use. To estimate emissions associated with the use of fireplaces in the residences, it was assumed that each residence would have three fireplaces, two of which would be wood burning, and one of which would be gas, and would have negligible emissions. The fireplaces would not be used for heating purposes, but rather for aesthetics. According to the EPA (<http://www.epa.gov/ttn/chief/eiip/techreport/volume09/firplc3.pdf>), the average amount of wood burned annual for aesthetics per household is 0.069 cords/year. Based on the EPA's AP-42 emission factors (EPA 1996), the emissions associated with fireplace wood burning were estimated. The emission calculations for total operational emissions are shown in Table 7.

Table 7
Total Operational Emissions

	ROC	NOx	CO	SOx	PM10	PM2.5
	Lbs/day					
Residential Energy Use	0.00015	0.000862	0.0000077	Negligible	0.0000302	0.00003
Fireplace Wood Burning	1.42	0.0161	1.57	0.00248	0.215	0.217
Vehicular Emissions	4.02	2.60	33.38	0.03	0.26	0.15
TOTAL	5.44	2.62	34.95	0.03	0.48	0.37
Significance Criteria	55	250	550	250	100	55
<i>Significant?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
	Tons/year					
Residential Energy Use	0.00000106	0.000157	0.0000273	Negligible	0.0000055	0.000006
Fireplace Wood Burning	0.260	0.00295	0.286	0.000453	0.00392	0.00380
Vehicular Emissions	0.73	0.47	6.09	0.01	0.05	0.03
TOTAL	0.99	0.47	6.38	0.01	0.05	0.03
Significance Criteria	10	40	100	100	15	10
<i>Significant?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Emissions would be below the significance thresholds for all pollutants.

Projects involving traffic impacts may result in the formation of locally high concentrations of CO, known as CO “hot spots.” To verify that the project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO “hot spots” was conducted. The Traffic Impact Analysis evaluated whether or not there would be a decrease in the level of service at the roadways and/or intersections affected by the Project. The potential for CO “hot spots” was evaluated based on the results of the Traffic Impact Analysis. In accordance with the County of San Diego’s requirements for air quality analyses, the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1998) was followed to determine whether a CO “hot spot” is likely to form due to Project-generated traffic. In accordance with the Protocol, CO “hot spots” are typically evaluated when (a) the level of service (LOS) of an intersection or roadway decreases to a LOS E or worse; (b) signalization and/or channelization is added to an intersection; and (c) sensitive receptors such as residences, commercial developments, schools, hospitals, etc. are located in the vicinity of the affected intersection or roadway segment.

Based on the Traffic Impact Analysis, the following intersections would degrade to LOS E or worse with the addition of project-related traffic to existing traffic levels:

- Buena Creek Road/Monte Vista Drive (LOS E, pm peak hour)

To evaluate the potential for CO “hot spots,” the procedures in the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol were used. The intersection for which the Project would cause a direct significant impact were evaluated, as cumulative impacts would be associated with total traffic in the area, and, as discussed in the Traffic Impact Analysis, would be fully mitigated by the Horizon Year 2030. As recommended in the Protocol, CALINE4 modeling was conducted for the intersection identified above for the Project plus cumulative traffic scenario. Modeling was conducted based on the guidance in Appendix B of the Protocol to calculate maximum predicted 1-hour CO concentrations. Predicted 1-hour CO concentrations

were then scaled to evaluate maximum predicted 8-hour CO concentrations using the recommended scaling factor of 0.7 for urban locations.

Inputs to the CALINE4 model were obtained from the Traffic Impact Analysis. As recommended in the Protocol, receptors were located at locations that were approximately 3 meters from the mixing zone, and at a height of 1.8 meters. For conservative purposes, average approach and departure speeds were assumed to be 1 mph, which results in higher CO emission rates and a conservative estimate of potential impacts. For conservative purposes, emission factors from the EMFAC2007 model for the year 2011 were used in the CALINE4 model, as emission factors for future years would be less than for 2011.

In accordance with the Caltrans ITS Transportation Project-Level Carbon Monoxide Protocol, it is also necessary to estimate future background CO concentrations in the project vicinity to determine the potential impact plus background and evaluate the potential for CO “hot spots” due to the project. The existing maximum 1-hour and 8-hour background concentrations of CO that was measured at the Escondido monitoring station for the period 2006 – 2008 of 5.7 and 3.61 ppm, respectively, were used to represent future maximum background 1-hour and 8-hour CO concentrations. CO concentrations in the future may be lower as inspection and maintenance programs and more stringent emission controls are placed on vehicles.

The CALINE4 model outputs are provided in Attachment A of this report. Table 9 presents a summary of the predicted CO concentrations (impact plus background) for the intersection evaluated for the Existing plus Cumulative plus Project traffic for the affected intersection. As shown in Table 8, the predicted CO concentrations would be substantially below the 1-hour and 8-hour NAAQS and CAAQS for CO shown in Table 1 of this report. Therefore, no exceedances of the CO standard are predicted, and the project would not cause or contribute to a violation of the air quality standard.

Table 8
CO “Hot Spots” Modeling Results

Intersection	Maximum 1-hour CO Concentration plus Background, ppm (CAAQS = 20 ppm)		Maximum 8- hour CO Concentration plus Background, ppm (CAAQS = 9 ppm)
	<i>am</i>	<i>pm</i>	
Buena Creek Road/Monte Vista	-	6.5	4.17

4.2.2.3 Mitigation Measures and Design Considerations

As discussed in the Traffic Impact Analysis (Linscott, Law & Greenspan 2009), certain intersections would be mitigated through implementation of traffic improvement projects and TIF program, and could include installing traffic signals. Certain of the mitigation measures are dependent on fair share contributions. However, due to reductions in CO emissions over time, CO “hot spots” would not occur at affected intersections. Because traffic impacts would be mitigated to less than significant levels and emissions of CO would continue to decrease with increasingly stringent vehicular emission standards and phase-out of older vehicles, CO “hot spots” would not result and no mitigation measures are required.

4.2.2.4 Conclusions

Emissions of all criteria pollutants would be less than the significance thresholds. An evaluation of the potential for CO “hot spots” was conducted in accordance with Caltrans guidance. Because CO “hot spots” modeling indicated that, even without mitigation, traffic congestion at those intersections experiencing a direct project impact would not result in exceedances of the CO standard, the project would not result in a significant impact for CO.

4.3 Cumulatively Considerable Net Increase of Criteria Pollutants

4.3.1 Guidelines for the Determination of Significance

Based on the County of San Diego guidelines (County of San Diego 2007), a project would result in a cumulatively significant impact if the project results in a significant contribution to the cumulative increase in pollutants for which the SDAB is listed as nonattainment for the CAAQS and NAAQS. As discussed in Section 2.0, the SDAB is considered a nonattainment area for the NAAQS for ozone and the CAAQS for ozone, PM₁₀, and PM_{2.5}.

Cumulatively considerable net increases during the construction phase would typically happen if two or more projects near each other are simultaneously constructing projects. A project that has a significant direct impact on air quality with regard to emissions of PM₁₀, PM_{2.5}, NO_x, or VOCs during construction would also have a significant cumulatively considerable net increase. In the event direct impacts from a proposed project are less than significant, a project may still have a cumulatively considerable impact on air quality if the emissions of concern from the proposed project, in combination with the emissions of concern from other proposed projects or reasonably foreseeable future projects within a proximity relevant to the pollutants of concern, are in excess of the guidelines identified in Section 3.0.

4.3.2 Significance of Impacts Prior to Mitigation

As discussed in Section 4.2.1.4, emissions of NO_x and PM₁₀ during construction and operations would be below the screening-level thresholds and would not result in a significant air quality impact.

Cumulative projects were identified in the Traffic Impact Analysis (Linscott, Law & Greenspan 2009). It is unlikely that any of the projects listed in the cumulative project list would be undergoing construction at the same time as the project.

The following equation is utilized in the SCAQMD's Localized Significance Threshold Methodology (SCAQMD 2003) to evaluate localized PM₁₀ impacts:

$$C_x = 0.9403 C_0 e^{-0.0462X}$$

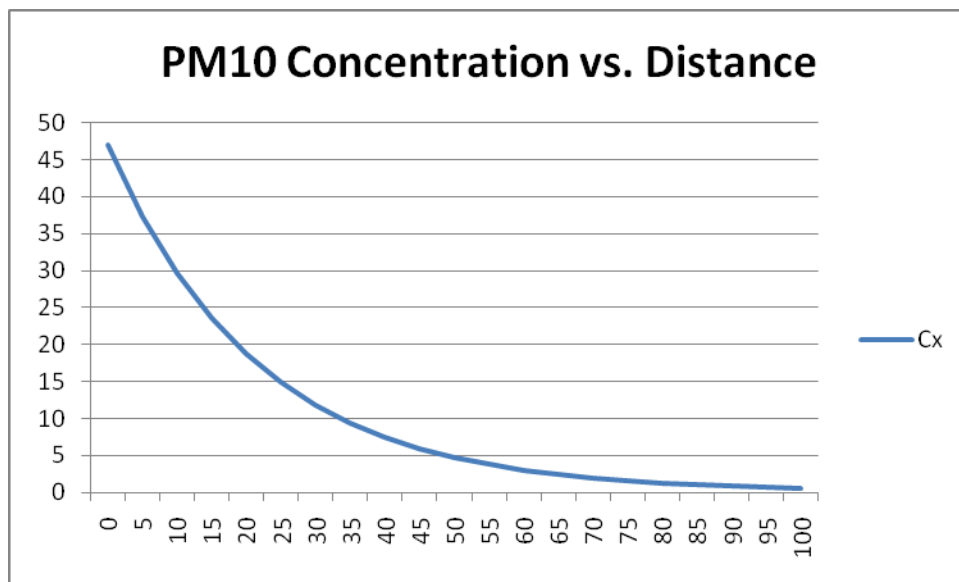
Where C_x = predicted PM₁₀ concentration at X meters from the fenceline;

C_0 = PM₁₀ concentration at the fenceline;

e = natural logarithm; and

X = distance in meters from the fenceline.

Conservatively assuming C_0 equals the 24-hour ambient air quality standard of 50 µg/m³, fugitive PM₁₀ concentrations would decrease with distance from the fenceline. As shown in the chart below, by 100 meters (approximately 330 feet) from the project boundary, the concentration of PM₁₀ would decrease by 99 percent.



No project within 100 meters of the Sugarbush boundary is anticipated to be undergoing construction simultaneously with the Sugarbush Project.

Modeling for individual projects cannot be conducted to evaluate a project's contribution to ozone concentrations due to the complexity of the modeling required and the necessity of modeling the entire air basin to evaluate ozone impacts. Basin-wide modeling is conducted by the APCD as part of its SIP attainment demonstration. The attainment demonstration is a modeling analysis that demonstrates that the SDAB will attain and maintain the ozone standards. The modeling analysis conducted for the attainment demonstration includes construction emissions as part of the analysis. With regard to cumulative impacts associated with ozone precursors, in general, provided a project is consistent with the community and general plans, it has been accounted for in the ozone attainment demonstration contained within the State Implementation Plan and would not cause a cumulatively significant impact on the ambient air quality for ozone.

The Sugarbush Residential Project is proposing development consistent with the levels accounted for in the current General Plan and therefore in the SIP. Furthermore, emissions of non-attainment pollutants comprise only a small percentage of the overall county-wide emissions budget and are less than the significance thresholds. The proposed addition of 45 single-family residences comprises a small percentage of the overall growth projected for the San Marcos Subregional Area. Emissions would therefore not be cumulatively considerable.

The planned or reasonably foreseeable projects were accounted for in the Traffic Impact Analysis, and were therefore considered in the evaluation of CO "hot spots." Based on the CO "hot spots" evaluation, a cumulative impact associated with traffic is not anticipated.

4.3.3 Mitigation Measures and Design Considerations

As no cumulatively considerable impact is projected, no mitigation measures are required. Standard Best Management Practices for dust control will be utilized during construction to reduce emissions of fugitive dust to the extent feasible.

4.3.4 Conclusions

Project construction and operation would not result in a cumulatively considerable impact on the ambient air quality.

4.4 Impacts to Sensitive Receptors

4.4.1 Guidelines for the Determination of Significance

Air quality regulators typically define “sensitive receptors” as schools, hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. However, for the purpose of CEQA analysis, the County of San Diego definition of “sensitive receptors” includes residences (County of San Diego 2007). The two primary emissions of concern for impacts to sensitive receptors are CO and diesel particulate matter. As discussed in Section 4.2.3.2, operational impacts would not result in CO “hot spots” because all intersections would be mitigated to LOS D or better. This analysis therefore focuses on diesel particulate matter.

4.4.2 Significance of Impacts Prior to Mitigation

To evaluate whether project construction could pose a significant impact to nearby sensitive receptors, an evaluation of diesel exhaust particulate matter was conducted. Diesel exhaust particulate matter is known to the state of California as carcinogenic compounds. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure, which is defined in the California Office of Environmental Health Hazard Assessment (OEHHA) guidelines, *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2003a) as 24 hours per day, 7 days per week, 365 days per year, for 70 years. Diesel exhaust particulate matter would be emitted during construction due to the operation of heavy equipment at the site. Because diesel exhaust particulate matter is considered to be carcinogenic, long-term exposure to diesel exhaust emissions have the potential to result in adverse health impacts.

Diesel exhaust particulate matter is known to the state of California as a carcinogenic substance. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure, which is defined in the California Air Pollution Control Officers' Association (CAPCOA) Air Toxics "Hot Spots" Program Risk Assessment Guidelines (CAPCOA 1993) as 24 hours per day, 7 days per week, 365 days per year, for 70 years. Diesel exhaust particulate matter would be emitted during the 18 months of construction assumed for the Project from heavy equipment used in the construction process. Because diesel exhaust particulate matter is considered to be carcinogenic, long-term exposure to diesel exhaust emissions have the potential to result in adverse health impacts.

To assess whether there is a potential for a significant impact associated with exposure to diesel exhaust particulate matter, a screening evaluation was conducted on the particulate emissions. The heavy equipment exhaust particulate emissions would be 4.79 lbs/day during site grading (4 months), 5.91 lbs/day during site utilities/infrastructure construction (6 months), and 1.93 lbs/day during house construction (8 months). Based on the configuration of heavy equipment sources, the emission source was represented as a point source 10 feet high, with a stack diameter of 6 inches, a stack exit temperature of 300 F, and a stack exit velocity of 1 meter/second, which is considered to be a minimum stack velocity. It was assumed that the equipment would operate for 8 hours per day, 6 days per week. The nearest existing receptors were located based on the site map and aerial photographs for the project area.

Eight existing receptors that are currently located near the proposed project construction activity were identified, and a receptor grid was placed in the residential area to the west. Seven of the eight receptors are located at residences located north of the Sugarbush development, and one receptor to the east, near the existing water tower. The risk evaluation was conducted to assess the potential for an unacceptable risk at these existing receptors due to exposure to diesel particulate emissions from heavy construction equipment during construction.

The EPA's approved air dispersion model, ISCST3, was used to estimate the downwind impacts at the closest receptors to the construction site. The model was run using preprocessed meteorological data from the Escondido surface meteorological monitoring station and the

MCAS Miramar upper air meteorological monitoring station for 2000. Escondido is closest meteorological monitoring station for which pre-processed meteorological data are available from the San Diego APCD. Based on the results of the modeling, risks associated with temporary exposure to diesel particulate from heavy equipment exhaust were estimated by multiplying the maximum annual impact by the diesel unit risk factor for carcinogenic risk. Because the unit risk factor is based on 70 years (840 months) of exposure for 24 hours per day, 365 days per year, the results of the analysis were scaled to an exposure of 8 hours per day, 6 days per week, for 18 months. The risks associated with exposure to diesel particulate were calculated as follows:

Risk (site grading) = annual average ground level concentration x unit risk factor ($3 \times 10^{-4} (\mu\text{g}/\text{m}^3)^{-1}$ x (8 hours/24 hours) x (6 days per week/7 days per week) x (4 months/840 months).

Risk (site utilities) = annual average ground level concentration x unit risk factor ($3 \times 10^{-4} (\mu\text{g}/\text{m}^3)^{-1}$ x (8 hours/24 hours) x (6 days per week/7 days per week) x (6 months/840 months).

Risk (house construction) = annual average ground level concentration x unit risk factor ($3 \times 10^{-4} (\mu\text{g}/\text{m}^3)^{-1}$ x (8 hours/24 hours) x (6 days per week/7 days per week) x (8 months/840 months).

Risks calculated for each phase of construction were considered to be additive.

Based on the risk calculations from the above equations, the maximum excess cancer risk predicted would be 0.337 in a million, which is below the County of San Diego's significant risk level of 1 in a million. Risks associated with exposure to diesel particulate during construction would therefore not be significant. Air dispersion modeling output files and risk calculations are provided in Appendix A.

Project construction would also not result in emission of any odor compounds that would cause a nuisance or significant impact to nearby receptors. The impacts associated with Project construction are therefore not considered significant.

Vehicular traffic may result in minor amounts of toxic air contaminants (TACs). Based on the County of San Diego's requirements, a quantitative evaluation of the potential for risks associated with exposure to diesel particulate emissions generated by vehicles from the proposed residences must be conducted. Based on EMFAC outputs (provided in Appendix A) and considering only light duty autos and light duty trucks, the total % of trips for diesel light duty autos is approximately 0.4%, and the total % of trips for diesel light duty trucks is approximately 0.4%. Therefore, there are approximately 2 trips per day out of 540 trips that would be attributable to diesel light duty autos (0.4% of 421 light-duty auto trips), and approximately 1 trip per day attributable to diesel light duty trucks (0.4% of 119 light-duty truck trips) out of 540 trips that would be attributable to diesel light duty trucks. Traffic would travel along Sugarbush Drive to access the Sugarbush Residential Development, for a distance of 0.2 miles, where existing receptors could be affected by emissions from diesel vehicles. Total daily emissions of diesel particulate were calculated to be 0.00019 lbs/day. Emission calculations are included in Appendix A.

Potential impacts to sensitive receptors were evaluated based on the South Coast Air Quality Management District's "Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions" (SCAQMD 2002). According to the Guidance, the ISCST3 model should be used to estimate impacts associated with diesel particulate exhaust emissions. The Guidance recommends the use of multiple adjacent volume sources to represent emission sources along the roadway; therefore, to model the potential impacts associated with emissions of diesel particulate from light duty autos and light duty trucks (vehicles from the proposed residences), a series of volume sources was placed from the intersection of Buena Creek Road and Sugarbush Drive along Sugarbush Drive to the Sugarbush Residential Development. Each of 37 volume sources was assumed to be 9.14 meters (30 feet) x 9.14 meters (30 feet), and was assumed to be at ground level. Emissions were divided among the 37 volume sources equally and were calculated to be 2.14×10^{-7} lbs/hour. Annual average concentrations were calculated at each receptor.

The highest annual average concentration was predicted at a receptor located near Sugarbush Drive. The highest annual average diesel particulate concentration was predicted to be 0.00019

$\mu\text{g}/\text{m}^3$. Multiplying by the unit risk factor of $3 \times 10^{-4} (\mu\text{g}/\text{m}^3)^{-1}$ to calculate excess cancer risk, assuming 70 years of exposure for 365 days per year, 24 hours per day, the maximum excess cancer risk along the roadway would be 0.057 in a million, which is below the San Diego County's significance threshold of 1 in a million. Impacts that are farther from the roadway would be lower as concentrations decrease with increasing distance from the roads. The potential impacts associated with exposure to diesel emissions from light duty autos and light duty trucks accessing the residences at the Sugarbush Residential Development are therefore not significant.

4.4.3 Mitigation Measures and Design Considerations

Because impacts to sensitive receptors from diesel particulate emissions would be less than significant, no additional mitigation measures are required.

4.4.4 Conclusions

Impacts to sensitive receptors would be less than significant.

4.5 Odor Impacts

4.5.1 Guidelines for the Determination of Significance

Based on the County of San Diego guidelines (County of San Diego 2007), a project would have a significant impact if it would generate objectionable odors or place sensitive receptors next to existing objectionable odors which will affect a considerable number of persons or the public.

4.5.2 Significance of Impacts Prior to Mitigation

Project construction could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust. Because the construction equipment would be operating at various locations throughout the construction site, and because any operation that would occur in the vicinity of existing receptors would be temporary, impacts associated with odors during construction are therefore not considered significant.

During construction, diesel equipment operating at the site may generate some nuisance odors; however, due to the distance of sensitive receptors to the project site and the temporary nature of construction, odors associated with project construction would not be significant.

The residential development itself would not be a source of odor impacts. According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting activities, refineries, landfills, dairies, and fiberglass molding operations. These land uses are not proposed for the Sugarbush Residential Project.

The project could produce objectionable odors, which would result from emissions from motor vehicles that may contain volatile organic compounds, ammonia, carbon dioxide, hydrogen sulfide, methane, alcohols, aldehydes, amines, carbonyls, esters, disulfides dust and endotoxins from the construction and operational phases. However, these substances, if present at all, would only be in trace amounts (less than 1 $\mu\text{g}/\text{m}^3$). Subsequently, no significant air quality odor impacts are expected to affect surrounding receptors. Moreover, the affects of objectionable odors are localized to the immediate surrounding area and will not contribute to a cumulatively considerable odor. A list of past, present and future projects within the surrounding area were evaluated and none of these projects create objectionable odors.

4.5.3 Mitigation Measures and Design Considerations

Because the project would not generate objectionable odors or place sensitive receptors near existing odor sources that would affect a considerable number of persons or the public, no mitigation measures or additional design considerations are required.

4.5.4 Conclusions

The project is a residential development. Due to the nature of the development as a residential development, there are no significant odorous air emissions anticipated from normal operations at the Sugarbush Residential Project. Odor impacts are therefore less than significant.

5.0 SUMMARY OF RECOMMENDED DESIGN FEATURES, IMPACTS, AND MITIGATION

In summary, the proposed project would result in emissions of air pollutants for both the construction phase and operational phase of the project. The air quality impact analysis evaluated the potential for adverse impacts to the ambient air quality due to construction and operational emissions. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment and construction workers commuting to and from the site. The emissions associated with construction are less than the significance criteria for all pollutants. Measures that are incorporated into the project description to reduce impacts associated with construction include the following:

- Multiple applications of water during grading between dozer/scrapper passes – 34-68%
- Paving, chip sealing or chemical stabilization of internal roadways after completion of grading – 92.5%
- Use of sweepers or water trucks to remove “track-out” at any point of public street access – 25-60%
- Termination of grading if winds exceed 25 mph – not quantified
- Stabilization of dirt storage piles by chemical binders, tarps, fencing or other erosion control – 30-65%

- Hydroseeding of graded residential lots unless lots are developed immediately after grading – 30-65%

These measures constitute best management practices for dust control.

Operational emissions would be associated with traffic accessing the Sugarbush development, with area sources such as fireplaces, energy use, and landscaping. Based on the evaluation of air emissions, the project emissions would be less than significant for all pollutants and would therefore not pose a significant impact or cumulatively considerable impact on the ambient air quality.

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